VERMONT
ENVIRONMENTAL CONSERVATION

GUIDANCE

Drinking Water and Groundwater Protection Division

LEAD AND COPPER SAMPLING AND SAMPLING PLAN GUIDANCE

Sample Number and Frequency

The number of samples required to be collected under the Lead and Copper (LCR) is based on your system's population. New public community and non-transient non-community water systems must collect two consecutive six-month rounds of samples under a standard monitoring protocol before qualifying for reduced monitoring. Under the standard monitoring protocol, the system establishes a pool of sample locations to be used for all sampling under the LCR. Systems that have exceeded the action level for lead and / or copper and 1) have installed corrosion control or 2) wish to test back into compliance must also collect two consecutive six-month rounds of samples under a standard monitoring protocol before qualifying for reduced monitoring. Systems on reduced monitoring must collect samples between June 1 and September 30. Samples should be collected under normal operating conditions. Please refer to the following table to determine the number of samples that must be collected under standard and reduced monitoring protocols:

Number of Samples		
System Population	**Number of Sites (Standard Monitoring)**	**Number of Sites (Reduced Monitoring)**
>100,000	100	50
10,001-100,000	60	30
3,301-10,000	40	20
501-3,300	20	10
101-500	10	5
≤100	5	5

Note: Systems with less than the required number of sampling sites must collect multiple samples from the same location on different days to meet the minimum sampling requirement.

Location and Rationale

Lead and copper samples need to be collected from locations that are most susceptible to high lead and copper concentrations. To determine sampling locations, systems must complete a construction materials evaluation to help classify sites into Tiers. Evaluations are used to select sample sites that have the highest probability for corrosion. Samples must be collected from Tier 1 locations where possible. When there are not enough Tier 1 sites, a system must complete sampling at Tier 2 sites followed by Tier 3 sites and lastly, sites identified as Other. Please refer to the following table for Tier classifications:

Lead and Copper Rule (LCR) Tier Classification			
Community Water Systems (CWS) – with copper pipes with lead solder or lead pipes		**Non-Transient Non-Community (NTNCs)** – with copper pipes with lead solder or lead pipes or served by lead service line	
Tier 1	Single-Family Structures • Served by lead service line • Installed 1983-1986	Tier 1	Any structure • Served by lead service line • Installed 1983-1986
Tier 2	Buildings including Multi-Family Structures • Served by lead service line • Installed 1983-1986	Tier 2	Any structure installed before 1983
Tier 3	Single-Family Structure installed before 1983	Tier 3	Not applicable
Other	Structures with other plumbing materials	Other	Structures with other plumbing materials

It is recommended that all systems identify more sampling sites than is required in case future circumstances prevent you from being able to sample at a previously approved location. Any changes to a system's approved sampling plan must be requested in writing and approved by the Drinking Water and Groundwater Protection Division (Division) prior to sampling.

Sample Collection

Each lead and copper sample must be collected in one – 1 liter container. Lead and copper samples are first-draw samples and must always be collected from a tap where the water has stood motionless in the pipes for at least 6 hours. Note: Lead and copper analyses from sample sites that have had abnormally long standing times without use may have elevated results. DO NOT perform flushing prior to letting the water sit for at least 6 hours. Samples should be taken from frequently-used locations that saw normal use prior to the 6 hour stand time. Samples must be collected at interior taps that are typically used for consumption. For single-family residences, samples should be drawn from cold-water kitchen or bathroom taps. Aerators must not be removed and samples should not be collected at locations with point-of-entry (e.g., water softeners) or point-of-use (e.g., water filters) treatment. Samples bottles should be filled at a flow rate as if you were filling a glass of water.

As with most monitoring, the Division recommends you collect samples early in the monitoring period. This is especially important for lead and copper samples because exceedance of the action level for either lead or copper requires additional monitoring before the end of the same period. Failing to complete the additional monitoring within the same period is a violation.

Evaluating Your Results

An exceedance of the action level for lead occurs when the 90^{th} percentile value for lead is greater than 0.015 mg/L (or 15 ppb). An exceedance of the action level for copper occurs if the 90^{th} percentile value for copper is greater than 1.3 mg/L. The 90^{th} percentile value is the value of which 10% of the samples are greater. Calculate the 90^{th} percentile as follows:

1. List results for lead or copper in ascending order (lowest to highest). Label the sample with the lowest result number 1, the next lowest number 2, etc.
2. Multiply the total number of samples collected by 0.9.
3. Match the result from number 2 to the associated lead or copper sample. The value for that sample is the 90^{th} percentile value for the monitoring period.

For specific examples on calculating your 90^{th} percentile, please refer to the Guidance Document entitled "How to Calculate Your 90^{th} Percentile Value."

If the system exceeds the action level, it must do the following:

1. Distribute public education materials within 24 hours of being notified by the Division of the action level exceedance (for lead only).
2. Collect water quality parameter samples (alkalinity, conductivity, pH (field test), calcium, hardness and temperature (field test)) at entry point (after treatment and storage but before distribution) and in distribution by the end of the lead and copper monitoring period.
3. Issue lead customer tap notifications to those locations where the system sampled for lead, including a copy of the sampling results within 30 days of receiving results. Send copies and the certification form to the Division within 3 months.
4. Collect raw source water samples and analyze for lead and/or copper (due within 6 months of action level exceedance).
5. Submit a corrosion control treatment recommendation (due within 6 months of action level exceedance).

The State will notify you of these requirements in writing and will include due dates for completion; however, it is ultimately the water system's responsibility to complete the requirements on time. Please pay particular attention to numbers 1 and 2 as they are the most time sensitive requirements. Please contact the Lead & Copper Rule Administrator, at the Drinking Water and Groundwater Protection Division, if you have exceeded the action level and are unsure of your next step.

This form and related environmental information are available electronically via the internet. For information visit us through the Vermont Homepage at http://www.vermont.gov or visit VT WSD directly at http://dec.vermont.gov/water

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